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In the Claims:

Claim 1 is amended herein. The remaining claims are not amended.

1. (currently amended) A two variable data interpolation system for processing image data, wherein an image value between a plurality of discrete image data values is interpolated by performing convolution operation corresponding to the plurality of discrete data positioned at equal intervals in a two dimensional space using a sampling function that is differentiable finite times and has values of a local support,

wherein, with letting a third order B spline function be $F(t), \text{ the sampling function, } \frac{H(t)}{H(t)}, \text{ is defined as follows:}$ H(t) = -F(t + 1/2)/4 + F(t) - F(t - 1/2)/4.

- 2. (previously presented) The two variable data interpolation system according to claim 1, wherein the sampling function is a function that is differentiable only once over a whole region.
 - 3. (canceled)
- 4. (previously presented) The two variable data interpolation system according to claim 1, wherein the third order B spline function F(t) is expressed as follows:

$$(4t^2 + 12t + 9)/4$$
 ; $-3/2 \le t < -1/2$

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$$-2t^{2} + 3/2$$
 ; $-1/2 \le t < 1/2$
 $(4t^{2}2 - 12t + 9)/4$; $1/2 \le t < 3/2$.

- 5. (canceled)
- 6. (previously presented) A two variable data interpolation system, wherein a value between a plurality of discrete data is interpolated by performing convolution operation corresponding to the plurality of discrete data positioned at equal intervals in a two dimensional space using a sampling function that is differentiable finite times and has values of a local support,

wherein, with letting a third order B spline function be F(t), the sampling function, (H(t), is defined as follows:

$$H(t) = -F(t + 1/2)/4 + F(t) - F(t - 1/2)/4$$
, comprising:

discrete data extracting unit for extracting a plurality of discrete data that exist within a predetermined range around a data interpolating position that becomes an object of interpolation operation;

sampling function operating unit for calculating a value of the sampling function H(t) for each of a plurality of discrete data extracted in this manner, with letting distance between the data interpolating position and discrete data be a t; and

convolution operating unit for obtaining a value of the data interpolating position by performing convolution operation through adding values of the sampling function that are

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calculated by the sampling function operating unit and correspond to the plurality of discrete data respectively.

- 7. (canceled)
- 8. (canceled)